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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,350	07/21/2003	Sascha Kreiskott	S-99,952	9406
35068	7590	07/27/2007		
LOS ALAMOS NATIONAL SECURITY, LLC LOS ALAMOS NATIONAL LABORATORY PPO. BOX 1663, LC/IP, MS A187 LOS ALAMOS, NM 87545			EXAMINER SMITH, NICHOLAS A	
			ART UNIT 1753	PAPER NUMBER
			MAIL DATE 07/27/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/624,350

Applicant(s)

KREISKOTT ET AL.

Examiner

Nicholas A. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-5 and 9-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 9-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 18 May 2007 has been entered.

### **Status of Claims**

2. Claims 1, 3-5 and 9-13 remain for examination.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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5. Claims 1, 3-4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arendt et al. (US 2003/0036483 A1) in view of Rosswag (US 4,372,831).

6. Regarding claim 1, Arendt teaches (0015-0016) a process of providing a highly smooth surface to a metallic tape, the process comprising: electrochemical polishing a metallic tape having an initial roughness of more than about 10 nm as a RMS roughness (which inherently includes passing the metallic tape through a bath contained within a polishing section of an electropolishing unit over a pre-selected period of time); and inherently passing a current density through the metallic tape during the period of time the metallic tape is in the bath whereby the roughness of the metallic tape is reduced to a RMS roughness of less than about 4 nm. It is noted that the inclusion of an inert oxide layer in Arendt'483 (paragraph [0015]) does not teach away from the instant claimed invention; the language of "metal tape that is a polycrystalline metal including nickel" is in "comprising" language, not "consisting essentially of" or "consisting of" language, which would preclude the use of an inert oxide layer.

7. Regarding claim 1, Arendt'483 teaches (0015) that the tape would be a polycrystalline metal including nickel.

8. Still regarding claim 1, Arendt'483 does not specify that the process would be continuous. However, it is prima facie obvious to make a batch process continuous. See MPEP 2144.04 V E. It would have been obvious to one of ordinary skill in the art to modify the method of Arendt'483 by making it continuous in order to achieve the normal and expected benefits of making a batch process continuous.

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9. Still regarding claim 1, Arendt'483 does not specify that the bath would be an acid bath. However, Rosswag teaches (abstract, col. 1 lines 13-57) an acid electrolyte for electropolishing in order to dissolve the surface of the metal. It would have been obvious to one of ordinary skill in the art to modify the method of Arendt'483 by providing an acid electrolyte for the bath in order to dissolve the surface of the metal as taught by Rosswag.

10. Still regarding claim 1, Arendt'483 does not specify that the current density would be at least 0.18 amperes per square centimeter. However, Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to electropolish at the desired current density by a routine optimization in order to obtain the desired finish. See MPEP 2144.05 II.

11. Regarding claims 3-4, Arendt'483 teaches (0016) that the final RMS roughness be reduced to less than about 1 nm, which overlaps with the claimed range of less than about 0.5 nm, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the desired final RMS roughness from the range of roughness values disclosed by Arendt'483 because Arendt'483 teaches the same utility throughout the disclosed ranges.

12. Still regarding claims 3-4, Arendt'483 does not specify that the current density would be at least 0.37 amperes per square centimeter. However, Rosswag teaches

(col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to electropolish at the desired current density by a routine optimization in order to obtain the desired finish. See MPEP 2144.05 II.

**13.** Regarding claim 13, the electropolishing method of Arendt'483 would inherently include passing the metallic tape through the bath and the bath would inherently provide electrical contact with the metallic tape.

**14.** Claims 1, 3-5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glowacki et al. (Texture development in long lengths of NiFe tapes for superconducting coated conductor) in view of Rosswag (US 4,372,831).

**15.** Regarding claim 1, Glowacki teaches (pages 167-168) a continuous process of providing a highly smooth surface to a metallic tape, the process comprising: passing a metallic tape having an initial roughness of more than about 10 nm as a RMS roughness through a bath contained within a polishing section of an electropolishing unit over a preselected period of time; and passing a current density through the metallic tape during the period of time the metallic tape is in the bath whereby the roughness of the metallic tape is reduced.

**16.** Regarding claim 1, Glowacki teaches (page 167) that the tape would be nickel and does not specify that it would be single crystalline, therefore it can be assumed to be polycrystalline because polycrystalline is the naturally occurring state of nickel.

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17. Still regarding claim 1, Glowacki does not specify that the bath would be an acid bath. However, Rosswag teaches (abstract, col. 1 lines 13-57) an acid electrolyte for electropolishing in order to dissolve the surface of the metal. It would have been obvious to one of ordinary skill in the art to modify the method of Glowacki by providing an acid electrolyte for the bath in order to dissolve the surface of the metal as taught by Rosswag.

18. Still regarding claim 1, Glowacki does not specify that the current density would be at least 0.18 amperes per square centimeter and does not specify achieving a RMS roughness of less than about 4 nm. However, Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art to modify the method of Glowacki by electropolish at the desired higher current densities by a routine optimization in order to obtain the desired mirror finish. See MPEP 2144.05 II. Furthermore, it is noted that in the Applicant's declaration (p.2, submitted 18 May 2007), mirror finish is representative of RMS roughness of 20 nm or less. It is clear from Rosswag that higher currents result in smooth films; furthermore, there are no negative teachings towards a higher current level than what is disclosed ( $0.08-0.20 \text{ A/cm}^2$ ) and therefore one of ordinary skill in the art could achieve a smooth as such as necessary by increasing the current as Rosswag teaches (Rosswag, col. 3, lines 27-30).

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19. Regarding claims 3-4, Glowacki does not specify that the current density would be at least 0.37 amperes per square centimeter and does not specify achieving a RMS roughness of less than about 0.5 nm. However, Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art to modify the method of Glowacki by electropolish at the desired higher current densities by a routine optimization in order to obtain the desired mirror finish. See MPEP 2144.05 II. Furthermore, it is noted that in the Applicant's declaration (p.2, submitted 18 May 2007), mirror finish is representative of RMS roughness of 20 nm or less. It is clear from Rosswag that higher currents result in smooth films; furthermore, there are no negative teachings towards a higher current level than what is disclosed (0.08-0.20 A/cm<sup>2</sup>) and therefore one of ordinary skill in the art could achieve a smooth as such as necessary by increasing the current as Rosswag teaches (Rosswag, col. 3, lines 27-30).

20. Regarding claim 5, Glowacki does not specify that the bath can contain a mixture of sulfuric and phosphoric acid. However, Rosswag teaches (col. 1 lines 30-39) the addition of a mixture of sulfuric and phosphoric acid to the bath in order to electropolish metallic workpieces. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to combine a mixture of sulfuric and phosphoric acid with the bath of Glowacki in order to electropolish the metallic tape as taught by Rosswag.

21. Regarding claim 13, the electropolishing method of Glowacki would inherently include passing the metallic tape through the bath and the bath would inherently provide electrical contact with the metallic tape.

22. Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glowacki in view of Rosswag as applied to claim 1 above, and further in view of Drummond et al. (US 2,330,562).

23. Regarding claim 9, the cited references do not specify that the metallic tape would be in direct electrical contact with an anode in the electropolishing unit while the metallic tape is within an electrically conductive liquid throughout the electropolishing unit and within the bath in the polishing section, the bath further in contact with a cathode in the electropolishing unit so as to complete an electrical circuit. However, Drummond teaches (Fig. 1 and col. 2 line 44 – col. 3 line 6) in a continuous electropolishing method that a thin metallic strip (10) would be in direct electrical contact with an anode (26) in the electropolishing unit while the metallic tape is with an electrically conductive liquid (16) throughout the electropolishing unit and with the bath in the polishing section, the bath further in contact with a cathode (22) in the electropolishing unit so as to complete an electrical circuit. It would have been obvious to combine the process of the cited prior art with the continuous electropolishing method of Drummond because the thin metal strip of Drummond is an analogous workpiece to the thin metallic tape of the cited prior art.

24. Regarding claim 12, the cited reference do not specify that the metallic tape would be in direct electrical contact with an anode in the electropolishing unit while the

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metallic tape is in contact with mechanical contacts as the metallic tape is passed through the bath so as to complete an electrical circuit. However, Drummond teaches (Fig. 1 and col. 2 line 44 – col. 3 line 6) in a continuous electropolishing method that a thin metallic strip (10) would be in direct electrical contact with an anode (24) in an electropolishing unit while the metallic tape is in contact with mechanical contacts (26) as the metallic tape is passed through the bath so as to complete an electrical circuit. It would have been obvious to one of ordinary skill in the art to combine the process of the cited prior art with the continuous electropolishing method of Drummond because the thin metal strip of Drummond is an analogous workpiece to the thin metallic tape of the cited prior art.

25. Claims 10-11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glowacki in view of Rosswag and Drummond as applied to claim 9 above, and further in view of Tezuka et al. (US 5,843,290).

26. Regarding claim 10, the cited prior art does not specify that the anode would include one of the claimed metals. However, Tezuka teaches (col. 6 lines 10-23) that it is preferable to use titanium as an anode when the electrolyte is an acidic electrolyte because the titanium is resistant to the electrolyte. It would have been obvious to modify the method of the cited prior art by forming the anode from titanium because titanium is resistant to acid electrolytes as taught by Tezuka.

27. Regarding claim 11, see the rejection of claim 5 above.

***Response to Arguments***

28. Applicant's remarks, see pages 5-6, filed 18 May 2007, with respect to the rejection based on Qiao (provisional application 60/483,956) have been fully considered and are persuasive. The 35 USC 103 rejections of claims 1, 3-5 and 9-13 under Qiao have been withdrawn.

29. Applicant's other arguments filed 18 May 2007 have been fully considered but they are not persuasive. In regards to Applicant's argument towards Arendt'483 in view of Rosswag, please see paragraph 6 above. In regards to Applicant's argument towards Glowacki in view of Rosswag, please see paragraphs 18-19 above. In regards to Applicant's argument towards Arendt'*Improvements* (Improvements of IBAD MgO Template Layers on Metallic Substrates for YBCO HTS Deposition (*IEEE Transactions of Applied Superconductivity*, vol. 13, no. 2, June 2003)), Arendt'*Improvements* indicates lowered surface roughness values further improve superconductivity characteristics; however, this does not teach away or obviate the rejections of Arendt'483 in view of Rosswag or Glowacki in view of Rosswag.

***Conclusion***

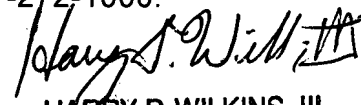
30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on (571)-272-1293. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

32. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
HARRY D. WILKINS, III  
PRIMARY EXAMINER

NAS